

Probability of Detection (POD) Testing Matrix

Material & Structure	Phase 1 Number of specimens	Phase 2 Number of specimens	Total Number of specimens	Eddy Current	Eddy Current (automated)	Magnetic Particle	Penetrant Level 3	Penetrant Level 4	Radiography (D3 film or equivalent speed)	Radiography (D4 film or equivalent speed)	Ultrasonics	Ultrasonics - Phased Array	Visual	X-ray - Storage film	X-ray - Digital CCD	X-ray Digital 2D sensor
Flawed Specimen (fatigue) 0.25" thick plate; 8"x 4"	GROUP A	GROUP A														
2219 T-87 Aluminum Flat plate flaws	16	44	60	x	x		x	x	x	x	x	x	x	x	x	x
6Al4V Titanium Flat plate flaws	16	44	60	x	x		x	x	x		x	x	x	x	x	x
Inconel 718 Flat plate flaws	16	44	60	x	x		x	x	x	x	x	x	x	x	x	x
Welded Specimen w/ Lack of Fusion Defects, 0.25" thick plate 8"x 4"	GROUP B1															
Embedded center lack of fusion flaws in 2219 T-87 Welded Aluminum Flat plate specimens	60		60	x	x				x	x	x	x	x	x	x	x
Embedded center lack of fusion flaws in 6Al4V Titanium Flat plate specimens	60		60	x	x				x	x	x	x	x	x	x	x
Welded Specimen w/ EDM Notches, 0.25" thick plate, 8"x 4"	GROUP B2															
TIG (Tungsten Inert Gas arc welding) Welded, Inconel 718 Flat plate specimen blanks to be used for EDM slots	20		20	x	x						x	x	x			
TIG Welded, 321 Stainless Steel Flat plate specimen blanks to be used for EDM slots	20		20	x	x						x	x	x			
TIG Welded, 2219 T-87 Aluminum Flat plate specimen blanks to be used for EDM slots	20		20	x	x						x	x	x			
TIG Welded, 6Al4V Titanium Flat plate specimen blanks to be used for EDM slots	20		20	x	x						x	x	x			
Tubing Welds w/ Fatigue Cracks, 0.049" wall thickness, 8" long	GROUP C1	GROUP C1														
Inconel 718, welded, 1" diameter tubes w/ induced fatigue cracks	16	44	60	x	x		x	x	x	x	x	x	x	x	x	x
321 Stainless Steel, welded, 1" diameter tubes w/ induced fatigue cracks	16	44	60	x	x	x	x	x	x	x	x	x	x	x	x	x
321 Stainless Steel, welded, 2" diameter tubes w/ induced fatigue cracks	16	44	60	x	x	x	x	x	x	x	x	x	x	x	x	x
Tubing Welds w/ Lack of Fusion Defects, 0.049" wall thickness, 8" long	GROUP C2															
Inconel 718, welded, 1" diameter tubes containing lack of fusion defects	60		60	x	x				x	x	x	x	x	x	x	x
321 Stainless Steel, welded, 1" diameter tubes containing lack of fusion defects	60		60	x	x				x	x	x	x	x	x	x	x
321 Stainless Steel, welded, 2" diameter tubes containing lack of fusion defects	60		60	x	x				x	x	x	x	x	x	x	x
Cracks in Fastener Holes, 0.125" thick plate, 8"x 12"	GROUP D	GROUP D														
Corner fatigue cracks in fastener holes in 2219 T-87 Aluminum (0.090" an 0.187" diam)	16	44	60	x	x	x	x	x	x	x	x	x	x	x	x	x
Corner fatigue cracks in fastener holes (0.090" an 0.187) in 6Al4V Titanium	16	44	60	x	x	x	x	x	x	x	x	x	x	x	x	x